MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
LABORATORY SERVICES PROGRAM

Landfill Monitoring Report
St Francois County Landfill
Permit 118701
St Francois County, Missouri
May 11, 1989

INTRODUCTION

At the request of the Waste Management Program, landfill monitoring was conducted on May 11, 1989, at the St Francois County Landfill in St Francois County, Missouri Sampling techniques and field analyses performed by Larron Laboratory were observed by Eric Sappington and Dave Mosby of the Laboratory Services Program, Division of Environmental Quality Rick Roberts and Fred Hutson of the Poplar Bluff Regional Office were also present to assist in the collection of leachate samples

METHODS

Grab samples were collected by Larron Laboratory personnel from monitoring wells #0101, #0103, #0104, and #0106

The sampling techniques and field analyses of the private laboratory were observed in the field and critiqued using "QA/QC Water Sampling Checklist For Solid Waste Disposal Facilities" (Appendix A)

The samples were split between private and state personnel for separate preservation, filtration and field analyses for pH, temperature and conductivity The state's portion was returned on ice to the Division Laboratory in Jefferson City for analyses

In addition to splitting samples from monitoring wells with the private laboratory, state personnel collected two leachate samples

OBSERVATIONS

Larron Laboratory personnel had not received a copy of the DNR Technical Bulletin titled "Collection And Analysis Of Water Samples" Consequently, they were not prepared to collect samples for analyses of organic parameters

There are a total of six monitoring wells at the landfill Wells #0102 and #0105 were dry and consequently not sampled

Although Larron Laboratory personnel sampled well #0104, the state lab did not obtain a split sample because there was not enough water for analyses by both laboratories

Due to an insufficient amount of water in well #0101, state personnel collected just enough sample volume for TOC analysis

The sample vials collected at well #0106 for TOC analysis were broken in the field and therefore were not analyzed

Two leachate grab samples were collected by Fred Hutson, Rick Roberts, and Dave Mosby Sample number 89-1361 was collected at a surface point downgradient of mining spoil piles and upgradient of the landfill Sample number 89-1362 was collected at a surface point downgradient of mining spoil piles and the landfill According to Fred Hutson, these surface points had been sampled in the past

RESULTS

See attached results for analyses performed on samples (Appendix B)

Submitted by

Eric Sappington
Water Quality Specialist
Water Quality Monitoring Unit
Laboratory Services Program

Date July 12, 1989

Approved by

James H Long
Director
Laboratory Services Program

JHL ES dlb

cc Miles Stotts, Unit Chief, Solid Waste Enforcement Section, Waste Management Program
Dean Smart, Waste Management Program

APPENDIX A

QA/QC WATER SAMPLING CHECKLIST FOR SOLID WASTE DISPOSAL FACILITIES

Landfill Monitoring Report
St Francois County Landfill
Permit 118701
St Francois County, Missouri
May 11, 1989

QA/QC WATER SAMPLING CHECKLIST FOR SOLID WASTE DISPOSAL FACILITIES

Facility Name: St. Francois County Landfill

Date of Sampling: May 11, 1989

Private Lab Name: Larron Laboratory

Private Lab Address: 529 Broadway

Cape Girardeau, Missouri 63701

Private Lab Phone No: (314) 334-8910

Participants	Name	Position Title
Facility		
State Lab	Eric Sappington	Water Quality Specialist
	Dave Mosby	Water Quality Specialist
Private Lab	Todd Robitsch	Chemical Technician
	Ron Farrow	Chemical Technician

I General Review of Monitoring Well Sample Collection Procedures — Y/N*

A Are monitoring wells sampled? — Y
If no, proceed to section II

B Monitoring Well Location and Security

1 Is a map of facility available to locate wells? — Y

2 Are monitoring wells marked so they can be located easily? — Y

3 Do monitoring wells have protective caps? — Y

4 Are protective caps locked to prevent unauthorized access? — N

C Measurement of Well Depths

1 Are measurements of both depth to standing water and depth to bottom of well made prior to well evacuation? — Y

2 Are measurements taken to nearest inch or 1 foot? — Y

3 Type of measuring device See remarks section

4 Is measuring device cleaned according to WMP guidelines? — Y

D Well Evacuation

1 What device is used to evacuate wells? 3 foot teflon bailer

2 Are low recharge wells evacuated to dryness? — Y

3 Are high recharge wells evacuated according to WMP guidelines? — Y

4 Is evacuated water disposed of properly? — Y

5 Does each well have dedicated evacuation equipment? — N

6 Is well evacuation equipment cleaned according to WMP guidelines? — Y

E Sample Collection

1 Does each well have dedicated sampling equipment? — N

2 If no to above, is sampling equipment cleaned according to WMP guidelines? — Y

* All No responses must be explained in Remarks Section

Y/N*

3 Is care taken to avoid placing clean sampling equipment on the ground or other contaminated surfaces prior to sample collection? Y

4 Are samples collected in a manner that will minimize aeration of the sample? Y

II General Review of Surface Point Sample Collection Procedures

A Are surface points sampled? N
If no, proceed to section III

B Surface Point Location and Description

1 Is a map of facility available to locate sampling points? N/A

2 Are sampling points marked so sampling will always occur at same location? N/A

3 If a stream, is presence or absence of flow recorded? N/A

4 Are water level conditions (above/below normal) noted? N/A

C Sample Collection

1 Does each surface point have dedicated sampling equipment? N/A

2 Is care taken to avoid placing clean sampling equipment on ground, or otherwise contaminating equipment prior to sample collection? N/A

3 Are samples collected in a manner consistent with WMP guidelines? N/A

III Review of Field Measurements, Sample Handling and Preservation Procedures

A Field Measurements

1 Are the following parameters measured in the field

a pH? Y

b temperature? Y

c specific conductivity? Y

d other (specify) N/A

2 Is equipment calibrated and maintained according to accepted procedures? Y

* All No responses must be explained in Remarks Section

Y/N*

3 Are field measurements determined using methods consistent with accepted procedures? Y

4 Are field measurements made on a split portion of sample rather than in a container that will be analyzed for other parameters? Y

B Sample Containers

1 Are sample containers for each parameter compatible and consistent with WMP guidelines? Y

C Sample Handling and Preservation

1 Are samples transferred from the sampling device directly to the appropriate containers? Y

2 Are samples containerized in order of their volatilization sensitivity? N/A

3 Are parameters requiring field filtration filtered immediately after sample collection through a 0 45 micron filter? N

4 Are samples preserved according to WMP approved guidelines? Y

IV Review of Field Documentation and Sample Chain-of-Custody Procedures

A Samples documentation

1 Are sample labels used? Y

2 Do they remain attached and legible even if wet? Y

3 Are labels attached immediately after samples are collected? Y

* All No responses must be explained in Remarks Section

		Y/N*
B	Site Information	
1	Is a field logbook maintained?	Y
2	Does it contain the following information	
a	time and date of well evacuation and sampling?	Y
b	weather conditions at time of sampling?	Y
c	well identification number?	Y
d	total depth of each well?	Y
e	static water level depth?	Y
f	well yield - high or low?	Y
g	well sampling sequence?	Y
h	field analysis data?	Y
i	field team members?	Y
j	unusual conditions or observations?	Y
C	Chain-of-Custody Record	
1	Is a Chain-of-Custody record included with each sample?	Y

* All No responses must be explained in Remarks Section

V Remarks (any No responses in above should be accompanied by an explanation in this section)

I.B.4. Well #0105 did not have a locked cap.

I.C.3. The private lab personnel used a bailer to find the static water level and depth to bottom. After marking these points on the rope, they removed the bailer from the well and used a tape measure to determine the depths.

I.D.5. The private lab personnel used the same bailer to evacuate and sample all of the wells.

I.E.1. See remark for I.D.5.

II.A. There are no surface points to be sampled.

III.C.3. The private lab personnel filtered their samples in the field at the end of the day after all of the wells had been sampled.

APPENDIX B

ANALYTICAL RESULTS

Landfill Monitoring Report
St Francois County Landfill
Permit 118701
St Francois County, Missouri
May 11, 1989

LABORATORY SERVICES PROGRAM
RESULT OF SAMPLE ANALYSIS

Sample No 89-1358

Reported to ERIC SAPPINGTON Date 6/29/89
Affiliation WQM Project Code 3532/3000

Sample Description
ST FRANCOIS CO LANDFILL, GRAB
WELL #0101
UPGRADIENT FROM LANDFILL

Collected by ERIC SAPPINGTON Date 05/11/89
Affiliation WQM

PARAMETERS	RESULTS
TEMPERATURE	14 6 DEGREES C
COMMENTS ANALYZED IN FIELD	
pH	7 6
COMMENTS ANALYZED IN FIELD	
SPECIFIC CONDUCTANCE	1077 uohms/cm
COMMENTS ANALYZED IN FIELD	
TOT ORGANIC CARBON	11 mg/L
COMMENTS ANALYZED BY PACE LABORATORIES, INC	

LABORATORY SERVICES PROGRAM
RESULT OF SAMPLE ANALYSIS

Sample No 89-1364

Reported to ERIC SAPPINGTON
Affiliation WQM

Date 7/13/89
Project Code 3532/3000

Sample Description
ST FRANCOIS CO LANDFILL, GRAB
WELL 0103

Collected by ERIC SAPPINGTON
Affiliation WQM

Date 05/11/89

PARAMETERS	RESULTS
TOTAL DISS SOLIDS	73 mg/L
TEMPERATURE	15 6 DEGREES C
COMMENTS ANALYZED IN FIELD	
pH	7 1
COMMENTS ANALYZED IN FIELD	
SPECIFIC CONDUCTANCE	1640 uohms/cm
COMMENTS ANALYZED IN FIELD	
HARDNESS AS CaCO3	1033 mg/L
CHEMICAL OXYGEN DEMAND	87 mg/L
FLUORIDE	0 10 mg/L
AMMONIA	0 25 mg/L
NITRITE-NITRATE	0 80 mg/L
TOTAL PHOSPHOROUS	0 09 mg/L
SULFATE	920 mg/L
CHLORIDE	2 1 mg/L

PARAMETERS	RESULTS
DISS SILVER	<1 0 ug/L
DISS ARSENIC	61 ug/L
DISS BORON	<100 ug/L
DISS BARIUM	<100 ug/L
DISS CALCIUM	290,000 ug/L
DISS CADMIUM	<2 0 ug/L
DISS COBALT	<60 ug/L
DISS CHROMIUM	<5 0 ug/L
DISS COPPER	<5 0 ug/L
DISS IRON	110 ug/L
DISS MERCURY	< 5 ug/L
DISS MAGNESIUM	75 mg/L
DISS MANGANESE	150 ug/L
DISS SODIUM	<2 0 mg/L
DISS LEAD	58 ug/L
DISS SELENIUM	<5 0 ug/L
DISS ZINC	140 ug/L
TOT ORGANIC CARBON	8 7 mg/L
COMMENTS ANALYZED BY PACE LABORATORIES, INC	
TOTAL ORGANIC HALOGENS	0 012 mg/L
COMMENTS ANALYZED BY PACE LABORATORIES, INC	

LABORATORY SERVICES PROGRAM
RESULT OF SAMPLE ANALYSIS

Sample No 89-1360

Reported to ERIC SAPPINGTON Date 7/13/89
Affiliation WQM Project Code 3532/3000

Sample Description
ST FRANCOIS CO LANDFILL, GRAB
WELL #0106

Collected by ERIC SAPPINGTON Date 05/11/89
Affiliation WQM

PARAMETERS	RESULTS
TOTAL DISS SOLIDS	110 mg/L
TEMPERATURE	14 3 DEGREES C
COMMENTS ANALYZED IN FIELD	
pH	6 7
COMMENTS ANALYZED IN FIELD	
SPECIFIC CONDUCTANCE	1940 uohms/cm
COMMENTS ANALYZED IN FIELD	
HARDNESS AS CaCO3	855 mg/L
CHEMICAL OXYGEN DEMAND	69 mg/L
FLUORIDE	0 31 mg/L
AMMONIA	32 0 mg/L
NITRITE-NITRATE	0 25 mg/L
TOTAL PHOSPHOROUS	0 06 mg/L
SULFATE	77 mg/L
CHLORIDE	130 mg/L

Sample no 89-1360
Date 7/13/89

PARAMETERS	RESULTS
DISS SILVER	<1 0 ug/L
DISS ARSENIC	48 ug/L
DISS BORON	220 ug/L
DISS BARIUM	280 ug/L
DISS CALCIUM	260,000 ug/L
DISS CADMIUM	<2 0 ug/L
DISS COBALT	<60 ug/L
DISS CHROMIUM	<5 0 ug/L
DISS COPPER	<5 0 ug/L
DISS IRON	13000 ug/L
DISS MERCURY	< 5 ug/L
DISS MAGNESIUM	50 mg/L
DISS MANGANESE	170 ug/L
DISS SODIUM	80 mg/L
DISS LEAD	34 ug/L
DISS SELENIUM	<5 0 ug/L
DISS ZINC	920 ug/L
TOTAL ORGANIC HALOGENS	0 103 mg/L

COMMENTS ANALYZED BY PACE LABORATORIES, INC

LABORATORY SERVICES PROGRAM
RESULT OF SAMPLE ANALYSIS

Sample No 89-1361

Reported to ERIC SAPPINGTON
Affiliation WQM

Date 7/13/89
Project Code 3532/3000

Sample Description
ST FRANCOIS CO LANDFILL, GRAB
LEACHATE BELOW SPOIL PILES
(ABOVE LANDFILL)

Collected by ERIC SAPPINGTON
Affiliation WQM

Date 05/11/89

PARAMETERS	RESULTS
TOTAL DISS SOLIDS	58 mg/L
TEMPERATURE	13 DEGREES C
COMMENTS ANALYZED IN FIELD	
pH	8 0
COMMENTS ANALYZED IN FIELD	
SPECIFIC CONDUCTANCE	849 uohms/cm
COMMENTS ANALYZED IN FIELD	
HARDNESS AS CaCO3	473 mg/L
CHEMICAL OXYGEN DEMAND	6 mg/L
FLUORIDE	0 30 mg/L
AMMONIA	<0 05 mg/L
NITRITE-NITRATE	0 25 mg/L
TOTAL PHOSPHOROUS	<0 05 mg/L
SULFATE	280 mg/L
CHLORIDE	2 4 mg/L

PARAMETERS	RESULTS
DISS SILVER	<1 0 ug/L
DISS ARSENIC	<5 0 ug/L
DISS BORON	<100 ug/L
DISS BARIUM	<100 ug/L
DISS CALCIUM	130,000 ug/L
DISS CADMIUM	4 6 ug/L
DISS COBALT	<60 ug/L
DISS CHROMIUM	<5 0 ug/L
DISS COPPER	<5 0 ug/L
DISS IRON	53 ug/L
DISS MERCURY	< 5 ug/L
DISS MAGNESIUM	36 mg/L
DISS MANGANESE	<20 ug/L
DISS SODIUM	<2 0 mg/L
DISS LEAD	28 ug/L
DISS SELENIUM	<5 0 ug/L
DISS ZINC	1800 ug/L
TOT ORGANIC CARBON	4 8 mg/L
COMMENTS : ANALYZED BY PACE LABORATORIES, INC	
TOTAL ORGANIC HALOGENS	<0 005 mg/L
COMMENTS ANALYZED BY PACE LABORATORIES, INC	

LABORATORY SERVICES PROGRAM
RESULT OF SAMPLE ANALYSIS

Sample No 89-1362

Reported to ERIC SAPPINGTON Date 7/13/89
Affiliation WQM Project Code 3532/3000

Sample Description
ST FRANCOIS CO LANDFILL
GRAB, LEACHATE BELOW SPOIL PILES AND ABOVE TUNNEL
(BELOW LANDFILL)

Collected by ERIC SAPPINGTON Date 05/11/89
Affiliation WQM

PARAMETERS	RESULTS
TOTAL DISS SOLIDS	160 mg/L
TEMPERATURE	15 DEGREES C
COMMENTS ANALYZED IN FIELD	
pH	7 1
COMMENTS ANALYZED IN FIELD	
SPECIFIC CONDUCTANCE	2005 uohms/cm
COMMENTS ANALYZED IN FIELD	
HARDNESS AS CaCO3	1127 mg/L
CHEMICAL OXYGEN DEMAND	40 mg/L
FLUORIDE	0 20 mg/L
AMMONIA	0 13 mg/L
NITRITE-NITRATE	<0 05 mg/L
TOTAL PHOSPHOROUS	0 21 mg/L
SULFATE	960 mg/L
CHLORIDE	32 mg/L

Sample no 89-1362
Date 7/13/89

PARAMETERS	RESULTS
DISS SILVER	<1 0 ug/L
DISS ARSENIC	<5 0 ug/L
DISS BORON	<100 ug/L
DISS BARIUM	<100 ug/L
DISS CALCIUM	270,000 ug/L
DISS CADMIUM	3 2 ug/L
DISS COBALT	560 ug/L
DISS CHROMIUM	<5 0 ug/L
DISS COPPER	<5 0 ug/L
DISS IRON	1100 ug/L
DISS MERCURY	< 5 ug/L
DISS MAGNESIUM	110 mg/L
DISS MANGANESE	320 ug/L
DISS SODIUM	19 mg/L
DISS LEAD	20 ug/L
DISS SELENIUM	<5 0 ug/L
DISS ZINC	7400 ug/L
TOT ORGANIC CARBON	2 4 mg/L
COMMENTS ANALYZED BY PACE LABORATORIES, INC	
TOTAL ORGANIC HALOGENS	0 006 mg/L
COMMENTS ANALYZED BY PACE LABORATORIES, INC	

LABORATORY SERVICES PROGRAM
RESULT OF SAMPLE ANALYSIS

Sample No 89-1359

Reported to ERIC SAPPINGTON Date 6/29/89
Affiliation WQM Project Code 3532/3000

Sample Description
FIELD BLANK FOR SAMPLES 891358 THRU 891362

Collected by ERIC SAPPINGTON Date 05/11/89
Affiliation WQM

PARAMETERS	RESULTS
TOT ORGANIC CARBON	3 3 mg/L
COMMENTS	ANALYZED BY PACE LABORATORIES, INC
TOTAL ORGANIC HALOGENS	<0 005 mg/L
COMMENTS	ANALYZED BY PACE LABORATORIES, INC